

## SIGNAL TECHNICIAN

**PURPOSE:** Ensure the dependability and functionality of existing and preexisting traffic signals and street lighting, for efficient vehicle flow and public safety on public streets and rights-of way.

### FUNCTIONAL AREAS:

1. Perform work to diagnose, repair, and maintain electrical and electronic signal systems, signal hardware and street lighting within the City of Duluth and surrounding municipalities.
  - \* A. Troubleshoot signal systems in order to locate malfunctions such as short, open or grounded circuits.
  - \* B. Perform work to replace transistors, diodes and other component parts of controllers.
  - \* C. Conduct testing in the field for proper timing and operation.
  - \* D. Perform work to clean, maintain and repair electronic and electrical equipment.
  - \* E. Perform work to set up, clean, maintain and repair signal standards, heads, hoods, connecting conduit and cables.
  - \* F. Perform work to connect, calibrate and check transformers, control boards, electronic circuit systems, circuit breakers, voltage regulators and related electronic and electrical equipment for proper operation.
  - \* G. Inspect the work of contractors for proper operation and to ensure contract specifications, are meet.
  - \* H. Perform work to rebuild and install electronic equipment.
  - \* I. Perform work to mark with paint and/or flags energized and de-energized electrical cables and conduits that are in danger of being damaged by any activity in the proximity of equipment.
  - \* J. Repair and replace traffic signal poles.
  - \* K. Perform work to replace and/or repair all underground wiring and conduit that has been damaged or needs to be relocated.
  - \* L. Perform work to remove and replace hand hole covers and collars in order to repair hand hole.
  - \* M. Perform work to connect stand-by generators for emergency back-up or a planned power shutdown.
  - \* N. Perform work to install temporary traffic signal, when needed.
  - \* O. Perform work to diagnose, repair, or replace any traffic signals component within the traffic signal cabinet.
  - \* P. Perform work to install traffic sensing loops.
  - \* Q. Perform work to test traffic signal components.
  - \* R. Perform work to replace or repair traffic signal lamps that have malfunctioned or burned out.

- \* S. Perform work to download and upload data between computer and signal system components.
  - \* T. Modify existing equipment in order to install or use a new technology or components, such as light emitting diode.
  - \* U. Establish new cabinets for installation on signal systems.
  - \* V. Perform work to implement and download detection programs to video detection cameras.
  - \* W. Implement and install controller programs.
  - \* X. Perform work to upload and download controller programs directly from a computer.
  - \* Y. Perform work to clean and organize work areas, bathrooms, vehicles, parking and storage areas.
2. Provide services related to planning, organizing, and maintaining traffic control systems and perform related tasks as assigned.
- \* A. Maintain tools and equipment.
  - \* B. Investigate complaints relating to proper operation of signal systems.
  - \* C. Train personnel in correct and safe operating procedures.
  - \* D. Compile reports and maintain files.
  - \* E. Maintain awareness of current industry developments by attending and participating in workshops, meetings, seminars, and/or training opportunities.
  - \* F. Operate light service vehicles, including aerial equipment.
  - \* G. Respond to citizens' inquiries, requests, and complaints.
  - \* H. Assist in ordering supplies, repair parts, and materials.
  - \* I. Provide testimony in court.
  - \* J. Adjust intersection signal timing.
  - \* K. Perform related tasks as required.

### **JOB REQUIREMENTS:**

1. Education and Experience Requirements
- + A. Possession of a State of Minnesota Class A Electrician's License and two years experience working with electronic or electrical signal systems; or
  - + B. Possession of a State of Minnesota Maintenance Electrician's License and eight years experience as a Traffic Signal Technician or equivalent.
2. License Requirements
- + A. Possession of a valid Class D Minnesota Driver's License or privilege.
  - + B. Ability to obtain a Minnesota Class B commercial drivers license within six (6) months of hire date.

### 3. Knowledge Requirements

- + A. Extensive knowledge of the principles, methods, equipment, and materials used in the repair of electronic and electrical signal systems.
- + B. Extensive knowledge of electronic theory and practice, including solid state and digital electronics.
- + C. Knowledge of mathematics at an advanced algebraic and trigonometric level.
- + D. Knowledge of the National Electrical Code.
- + E. Knowledge of state and local regulations governing electrical wiring.
- + F. Knowledge of precautionary, safety, and fire prevention methods involved in electrical work.
- + G. Knowledge of applicable safety regulations.

### 4. Skill Requirements

- + A. Skill in diagnosing, maintaining, and repairing diverse electronic and electrical equipment at the component level.
- + B. Skill in communicating with others to determine the nature of equipment malfunction and assist with problem diagnosis.
- + C. Skill in manipulating tools and equipment using fine hand movements.
- + D. Skill in performing mathematical calculations in order to size wire and determine current load.
- + E. Skill in reading and interpreting blueprints and schematic drawings.

### 5. Abilities Requirements

- + A. Ability to work outside year around.
- + B. Ability to work from ladders and scaffolds up to fifty feet high.
- + C. Ability to use hand and power tools.
- + D. Ability to establish and maintain effective working relationships with co-workers, supervisors, and the general public.
- + E. Ability to plan, assign, and supervise the work of assigned personnel.
- + F. Ability to make repairs on electrical and electronic signal equipment.
- + G. Ability to do light welding.
- + H. Ability to safely operate service vehicles.
- + I. Ability to work on-call after completion of regular assigned work hours.
- + J. Ability to feel to perceive temperature fluctuations caused by equipment malfunction.
- + K. Ability to smell to distinguish overheated or burned-out components, often by type of component.

- + L. Ability to routinely lift and carry various tools boxes weighing up to 40 pounds and occasionally lift and carry with assistance street lighting light poles weighing up to 70 pounds.
- + M. Ability to work in confined spaces.
- + N. Ability to stand, walk, kneel, crouch, and stoop, as needed to perform work activities.
- + O. Ability to attend work on a regular basis.
- \* Essential functions of the job.
- + Job requirements needed on the first day of employment.

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